AMENDMENTS TO THE CLAIMS

This listing of claims replaces all prior versions, and listings, of claims in the application:

Listing of Claims

1-24. (Cancelled)

25. (New) A training method for a power amplifier pre-distorter formed by a Finite Impulse Response (FIR) filter structure comprising an individual look-up table for each filter tap, each look-up table representing a discretized polynomial in a variable representing input signal amplitude, and means for selecting, from each filter tap look-up table, a filter coefficient that depends on the amplitude of a corresponding complex signal value to be multiplied by the filter tap, said training method comprising the steps of:

storing measured unamplified input signal samples and corresponding power amplifier output signal feedback samples; and,

determining look-up table filter coefficients for each filter tap by separate independent iterative procedures using said stored samples.

26. (New) The method of claim 25, wherein said iterative procedures are least mean square based.

27. (New) The method of claim 26, further comprising the step of calculating a refined filter coefficient estimate $T_{qi}(b)$ corresponding to a filter tap with a delay *q* and a signal amplitude bin *b* from a previous filter coefficient estimate $T_{qi-1}(b)$ in accordance with the equation:

$$T_{qi}(b) = T_{qi-1}(b) + \mu_q \cdot \frac{1}{N_b} \cdot \sum_{|x_{k-q}| \in M_b} \frac{x_k - y_k}{|x_{k-q}|^2} \cdot x_{k-q}^*$$

where:

μ_q is a predetermined constant associated with filter tap *q*;

N_b is the number of stored input signal samples that have an amplitude that falls within a predetermined window M_b around the center amplitude of bin *b*;

x_{k-q} is a stored input signal sample that has a delay q;

y_k is a power amplifier output signal feedback sample corresponding to power amplifier input signal sample x_k; and,

* denotes complex conjugation.

28. (New) The method of claim 26, further comprising the step of calculating a refined filter coefficient estimate $T_{qi}(b)$ corresponding to a filter tap with a delay q and a signal amplitude bin b from a previous filter coefficient estimate $T_{qi-1}(b)$ in accordance with the equation:

$$\begin{cases} T_{qi}(b) = T_{qi-1}(b) + \mu_q \cdot u(b)\dfrac{1}{N_b} \cdot \sum\limits_{|x_{k-q}| \in M_b} (x_k - y_k) \cdot x_{k-q}^* \\ u(b) = \dfrac{1}{\overline{|x_b|}^2} \end{cases}$$

where:

μ_q is a constant associated with filter tap q;

N_b is the number of stored input signal samples that have an amplitude that falls within a predetermined window M_b around the center amplitude $\overline{|x_b|}$ of bin b;

x_{k-q} is a stored input signal sample that has a delay q;

y_k is a power amplifier output signal feedback sample corresponding to input signal sample x_k; and,

* denotes complex conjugation.

29. (New) The method of claim 26, further comprising the step of calculating a refined filter coefficient estimate $T_{qi}(b)$ corresponding to a filter tap with a delay q and a signal amplitude bin b from a previous filter coefficient estimate $T_{qi-1}(b)$ in accordance with the equation:

$$T_{qi}(b) = T_{qi-1}(b) + \mu_q \cdot (x_k - y_k) \cdot \frac{x^*_{k-q}}{|x_{k-q}|^2} : \quad |x_{k-q}| \in M_b$$

where:

μ_q is a constant associated with filter tap q;

x_{k-q} is a stored input signal sample that has that has a delay q and an amplitude that falls within a predetermined window M_b around the center amplitude of bin b;

y_k is a power amplifier output signal feedback sample corresponding to input signal sample x_k; and,

* denotes complex conjugation.

30. (New) The method of claim 26, further comprising the step of calculating a refined filter coefficient estimate $T_{qi}(b)$ corresponding to a filter tap with a delay q and a signal amplitude bin b from a previous filter coefficient estimate $T_{qi-1}(b)$ in accordance with the equation:

$$\begin{cases} T_{qi}(b) = T_{qi-1}(b) + \mu_q \cdot u(b) \cdot (x_k - y_k) \cdot x^*_{k-q} : \quad |x_{k-q}| \in M_b \\ u(b) = \dfrac{1}{\overline{|x_b|}^2} \end{cases}$$

where:

μ_q is a constant associated with filter tap q;

x_{k-q} is a stored input signal sample that has a delay q and an amplitude that falls within a predetermined window M_b around the center amplitude $\overline{|x_b|}$ of bin b;

x_k is a power amplifier input signal sample that y_{k-q} is a power amplifier output signal feedback sample corresponding to input signal sample x_k; and,

* denotes complex conjugation.

31. (New) A power amplifier pre-distorter formed by a Finite Impulse Response (FIR) filter structure comprising an individual look-up table for each filter tap, each look-up table representing a discretized polynomial in a variable representing input signal amplitude, and means for selecting, from each filter tap look-up table, a filter coefficient that depends on the amplitude of a corresponding complex signal value to be multiplied by the filter tap, wherein the pre-distorter comprises:

means for storing measured unamplified input signal samples and corresponding power amplifier output signal feedback samples; and,

means for determining look-up table filter coefficients for each filter tap by separate independent iterative procedures using said stored samples.

32. (New) The pre-distorter of claim 31, further comprising means for implementing said iterative procedures as least mean square based iterative procedures.

33. (New) The pre-distorter of claim 32, further comprising means for calculating a refined filter coefficient estimate $T_{qi}(b)$ corresponding to a filter tap with a delay q and a signal amplitude bin b from a previous filter coefficient estimate $T_{qi-1}(b)$ in accordance with the equation:

$$T_{qi}(b) = T_{qi-1}(b) + \mu_q \cdot \frac{1}{N_b} \cdot \sum_{|x_{k-q}| \in M_b} \frac{x_k - y_k}{|x_{k-q}|^2} \cdot x^*_{k-q}$$

where:

μ_q is a predetermined constant associated with filter tap q;

N_b is the number of stored input signal samples that have an amplitude that falls within a predetermined window M_b around the center amplitude of bin b;

x_{k-q} is a stored input signal sample that has a delay q;

y_k is a power amplifier output signal feedback sample corresponding to input signal sample x_k; and,

* denotes complex conjugation.

34. (New) The pre-distorter of claim 32, further comprising means for calculating a refined filter coefficient estimate $T_{qi}(b)$ corresponding to a filter tap with a delay q and a signal amplitude bin b from a previous filter coefficient estimate $T_{qi-1}(b)$ in accordance with the equation:

$$\begin{cases} T_{qi}(b) = T_{qi-1}(b) + \mu_q \cdot u(b)\dfrac{1}{N_b} \cdot \sum\limits_{|x_{k-q}| \in M_b} (x_k - y_k) \cdot x_{k-q}^* \\ u(b) = \dfrac{1}{\overline{|x_b|}^2} \end{cases}$$

where:

μ_q is a constant associated with filter tap q;

N_b is the number of stored input signal samples that have an amplitude that falls within a predetermined window M_b around the center amplitude $\overline{|x_b|}$ of bin b;

x_{k-q} is a stored input signal sample that has a delay q;

y_k is a power amplifier output signal feedback sample corresponding to input signal sample x_k; and,

* denotes complex conjugation.

35. (New) The pre-distorter of claim 32, further comprising means for calculating a refined filter coefficient estimate $T_{qi}(b)$ corresponding to a filter tap with a delay q and a signal amplitude bin b from a previous filter coefficient estimate $T_{qi-1}(b)$ in accordance with the equation:

$$T_{qi}(b) = T_{qi-1}(b) + \mu_q \cdot (x_k - y_k) \cdot \frac{x^*_{k-q}}{|x_{k-q}|^2} : \quad |x_{k-q}| \in M_b$$

where:

μ_q is a constant associated with filter tap q;

x_{k-q} is a stored input signal sample that has that has a delay q and an amplitude that falls within a predetermined window M_b around the center amplitude of bin b;

y_k is a power amplifier output signal feedback sample corresponding to input signal sample x_k; and,

* denotes complex conjugation.

36. (New) The pre-distorter of claim 32, further comprising means for calculating a refined filter coefficient estimate $T_{qi}(b)$ corresponding to a filter tap with a delay q and a signal amplitude bin b from a previous filter coefficient estimate $T_{qi-1}(b)$ in accordance with the equation:

$$\begin{cases} T_{qi}(b) = T_{qi-1}(b) + \mu_q \cdot u(b) \cdot (x_k - y_k) \cdot x^*_{k-q} : \quad |x_{k-q}| \in M_b \\ u(b) = \dfrac{1}{\overline{|x_b|}^2} \end{cases}$$

where:

μ_q is a constant associated with filter tap q;

x_{k-q} is a stored input signal sample that has a delay q and an amplitude that falls within a predetermined window M_b around the center amplitude $\overline{|x_b|}$ of bin b;

x_k is a power amplifier input signal sample that y_{k-q} is a power amplifier output signal feedback sample corresponding to input signal sample x_k; and,

* denotes complex conjugation.

37. (New) A power amplifier having a pre-distorter formed by a Finite Impulse Response (FIR) filter structure comprising an individual look-up table for each filter tap, each look-up table representing a discretized polynomial in a variable representing input signal amplitude, and means for selecting, from each filter tap look-up table, a filter coefficient that depends on the amplitude of a corresponding complex signal value to be multiplied by the filter tap, said pre-distorter comprising:

means for storing measured unamplified input signal samples and corresponding power amplifier output feedback signal samples; and,

means for determining look-up table filter coefficients for each filter tap by separate independent iterative procedures using said stored samples.

38. (New) The power amplifier of claim 37, further comprising means for implementing said iterative procedures as least mean square based iterative procedures.

39. (New) The power amplifier of claim 38, further comprising means for calculating a refined filter coefficient estimate $T_{qi}(b)$ corresponding to a filter tap with a delay q and a signal amplitude bin b from a previous filter coefficient estimate $T_{qi-1}(b)$ in accordance with the equation:

$$T_{qi}(b) = T_{qi-1}(b) + \mu_q \cdot \frac{1}{N_b} \cdot \sum_{|x_{k-q}| \in M_b} \frac{x_k - y_k}{|x_{k-q}|^2} \cdot x_{k-q}^*$$

where:

μ_q is a predetermined constant associated with filter tap q;

N_b is the number of stored input signal samples that have an amplitude that falls within a predetermined window M_b around the center amplitude of bin b;

x_{k-q} is a stored input signal sample that has a delay q;

y_k is a power amplifier output signal feedback sample corresponding to input signal sample x_k; and,

* denotes complex conjugation.

40. (New) The power amplifier of claim 38, further comprising means for calculating a refined filter coefficient estimate $T_{qi}(b)$ corresponding to a filter tap with a delay q and a signal amplitude bin b from a previous filter coefficient estimate $T_{qi-1}(b)$ in accordance with the equation:

$$\begin{cases} T_{qi}(b) = T_{qi-1}(b) + \mu_q \cdot u(b) \dfrac{1}{N_b} \cdot \displaystyle\sum_{|x_{k-q}| \in M_b} (x_k - y_k) \cdot x_{k-q}^* \\ u(b) = \dfrac{1}{\overline{|x_b|}^2} \end{cases}$$

where:

μ_q is a constant associated with filter tap q;

N_b is the number of stored input signal samples that have an amplitude that falls within a predetermined window M_b around the center amplitude $\overline{|x_b|}$ of bin b;

x_{k-q} is a stored input signal sample that has a delay q;

y_k is a power amplifier output signal feedback sample corresponding to input signal sample x_k; and,

* denotes complex conjugation.

41. (New) The power amplifier of claim 38, further comprising means for calculating a refined filter coefficient estimate $T_{qi}(b)$ corresponding to a filter tap with a delay q and a signal amplitude bin b from a previous filter coefficient estimate $T_{qi-1}(b)$ in accordance with the equation:

$$T_{qi}(b) = T_{qi-1}(b) + \mu_q \cdot (x_k - y_k) \cdot \frac{x_{k-q}^*}{|x_{k-q}|^2} : \quad |x_{k-q}| \in M_b$$

where:

μ_q is a constant associated with filter tap q;

x_{k-q} is a stored input signal sample that has that has a delay q and an amplitude that falls within a predetermined window M_b around the center amplitude of bin b;

y_k is a power amplifier output signal feedback sample corresponding to input signal sample x_k; and,

* denotes complex conjugation.

42. (New) The power amplifier of claim 38, further comprising means for calculating a refined filter coefficient estimate $T_{qi}(b)$ corresponding to a filter tap with a delay q and a signal amplitude bin b from a previous filter coefficient estimate $T_{qi-1}(b)$ in accordance with the equation:

$$\begin{cases} T_{qi}(b) = T_{qi-1}(b) + \mu_q \cdot u(b) \cdot (x_k - y_k) \cdot x_{k-q}^* : & |x_{k-q}| \in M_b \\ u(b) = \dfrac{1}{\left|\overline{x_b}\right|^2} \end{cases}$$

where:

μ_q is a constant associated with filter tap q;

x_{k-q} is a stored input signal sample that has a delay q and an amplitude that falls within a predetermined window M_b around the center amplitude $\left|\overline{x_b}\right|$ of bin b;

x_k is a power amplifier input signal sample that y_{k-q} is a power amplifier output signal feedback sample corresponding to input signal sample x_k; and,

* denotes complex conjugation.

43. (New) A base station provided with a power amplifier having a pre-distorter formed by a Finite Impulse Response (FIR) filter structure comprising an individual look-up table for each filter tap, each look-up table representing a discretized polynomial in a variable representing input signal amplitude, and means for selecting, from each filter tap look-up table, a filter coefficient that depends on the amplitude of a

corresponding complex signal value to be multiplied by the filter tap, said pre-distorter comprising:

means for storing measured unamplified input signal samples and corresponding power amplifier output signal feedback samples; and,

means for determining look-up table filter coefficients for each filter tap by separate independent iterative procedures using said stored samples.

44. (New) The base station of claim 43, further comprising means for implementing said iterative procedures as least mean square based iterative procedures.

45. (New) The base station of claim 44, further comprising means for calculating a refined filter coefficient estimate $T_{qi}(b)$ corresponding to a filter tap with a delay q and a signal amplitude bin b from a previous filter coefficient estimate $T_{qi-1}(b)$ in accordance with the equation:

$$T_{qi}(b) = T_{qi-1}(b) + \mu_q \cdot \frac{1}{N_b} \cdot \sum_{|x_{k-q}| \in M_b} \frac{x_k - y_k}{|x_{k-q}|^2} \cdot x_{k-q}^*$$

where:

μ_q is a predetermined constant associated with filter tap q;

N_b is the number of stored input signal samples that have an amplitude that falls within a predetermined window M_b around the center amplitude of bin b;

x_{k-q} is a stored input signal sample that has a delay q;

y_k is a power amplifier output signal feedback sample corresponding to input signal sample x_k; and,

* denotes complex conjugation.

46. (New) The base station of claim 44, further comprising means for calculating a refined filter coefficient estimate $T_{qi}(b)$ corresponding to a filter tap with a delay q and a signal amplitude bin b from a previous filter coefficient estimate $T_{qi-1}(b)$ in accordance with the equation:

$$\begin{cases} T_{qi}(b) = T_{qi-1}(b) + \mu_q \cdot u(b)\dfrac{1}{N_b} \cdot \displaystyle\sum_{|x_{k-q}| \in M_b} (x_k - y_k) \cdot x^*_{k-q} \\ u(b) = \dfrac{1}{\overline{|x_b|}^2} \end{cases}$$

where:

μ_q is a constant associated with filter tap q;

N_b is the number of stored input signal samples that have an amplitude that falls within a predetermined window M_b around the center amplitude $\overline{|x_b|}$ of bin b;

x_{k-q} is a stored input signal sample that has a delay q;

y_k is a power amplifier output signal feedback sample corresponding to input signal sample x_k; and,

* denotes complex conjugation.

47. (New) The base station of claim 44, further comprising means for calculating a refined filter coefficient estimate $T_{qi}(b)$ corresponding to a filter tap with a delay q and a signal amplitude bin b from a previous filter coefficient estimate $T_{qi-1}(b)$ in accordance with the equation:

$$T_{qi}(b) = T_{qi-1}(b) + \mu_q \cdot (x_k - y_k) \cdot \frac{x^*_{k-q}}{|x_{k-q}|^2} : \quad |x_{k-q}| \in M_b$$

where:

μ_q is a constant associated with filter tap q;

x_{k-q} is a stored input signal sample that has that has a delay q and an amplitude that falls within a predetermined window M_b around the center amplitude of bin b;

y_k is a power amplifier output signal feedback sample corresponding to input signal sample x_k; and,

* denotes complex conjugation.

48. (New) The base station of claim 44, further comprising means for calculating a refined filter coefficient estimate $T_{qi}(b)$ corresponding to a filter tap with a delay q and a signal amplitude bin b from a previous filter coefficient estimate $T_{qi-1}(b)$ in accordance with the equation:

$$\begin{cases} T_{qi}(b) = T_{qi-1}(b) + \mu_q \cdot u(b) \cdot (x_k - y_k) \cdot x^*_{k-q} : & |x_{k-q}| \in M_b \\ u(b) = \dfrac{1}{\overline{|x_b|}^2} \end{cases}$$

where:

μ_q is a constant associated with filter tap q;

x_{k-q} is a stored input signal sample that has a delay q and an amplitude that falls within a predetermined window M_b around the center amplitude $\overline{|x_b|}$ of bin b;

x_k is a power amplifier input signal sample that y_{k-q} is a power amplifier output signal feedback sample corresponding to input signal sample x_k; and,

* denotes complex conjugation.